



PATENT: 06354ZP USA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

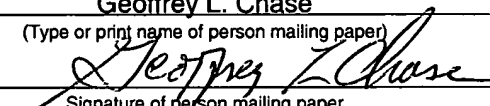
IN RE APPLI-
CATION OF : SIDDIQUI, ET. AL. : CONFIRM. NO. 2963

SERIAL NO. : 10/730,527 : GRP. ART UNIT: 1755

FILED : 12/08/03 : EXAMINER: MARCHESCHI

FOR : COMPOSITION AND ASSOCIATED METHOD FOR OXIDE
CHEMICAL MECHANICAL PLANARIZATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Sir:

DECLARATION OF JUNAID AHMED SIDDIQUI UNDER RULE 132

Responsive (with a 2 month extension) to the Office Action of 21 September 2005, rejecting Claims 1, 3-9 and 11-18, Applicant submits this Declaration of Junaid Ahmed Siddiqui, PhD., the inventor of the present invention.

Dr. Siddiqui states:

1. He is a resident of 5720 Turkey Oak Road, Richmond, VA 23237.
2. He is a graduate of Karachi University in Pakistan with a B.S. in Chemistry with honors awarded in 1966, a graduate of the University of Western Ontario, Canada with a M.S. in Photochemistry awarded in 1969, and a graduate of the University of Cincinnati with a Ph.D. in Physical Chemistry awarded in 1973.

3. He was a postdoctoral fellow at the National Aeronautics and Space Administration (NASA) during 1973-75 and a teaching post-doctoral fellow at Virginia Commonwealth University during 1975-76.

4. He was employed by Imperial Chemical Industries from 1976-1997 and was and is employed by E.I. DuPont de Nemours from 1997 to the present. Since 2000 to the present, he has been on assignment to DuPont Air Products NanoMaterials L.L.C., a joint venture between DuPont and Air Products, working in the area of development of new nanoslurry dispersions for chemical mechanical planarization in microelectronic applications. During the period 2000-2004, he was Chief Scientist for this joint venture.

5. He is an inventor in the present Application Serial No. 10/730,527 filed December 8, 2003 for "Composition and Associated Method for Oxide Chemical Mechanical Planarization".

6. He has read and understood the present Application Serial No. 10/730,527 filed December 8, 2003 for "Composition and Associated Method for Oxide Chemical Mechanical Planarization".

7. He has read and understood the cited references of record; US 6,736,905; US 6,471,735; US 5,993,686; and McCutcheon's Vol. 1, Emulsifier & Detergents, 1999, N. American Edition.

8. He has read and understood the Examiner's Office Action dated 21 September 2005.

9. With the objective of obtaining unexpected results that are clear and convincing with regard to the invention defined in this patent application (as indicated as being desirable on Page 6 of the 21 September 2005 Office Action), he has directed further experimental work on testing chemical mechanical planarization (CMP) samples that contain silica, ammonium fluoride, and either an inventive hydroxy alkyne surfactant (i.e., Surfynol® 104e) or an unclaimed ethoxylated alkyne surfactant (i.e., Surfynol® 465), as well as one

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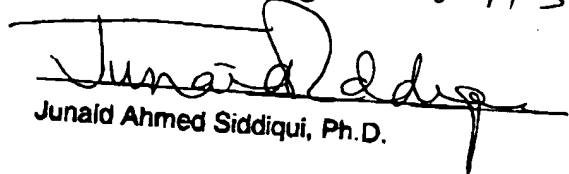
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example (#3) where silica at pH 10.5 is the polishing medium with ammonium fluoride and surfactant being absent. The experimental work done is summarized in attached Table 2 as Examples 3-7.

10. He is of the opinion, as an expert skilled in the art, that the results of this further experimental work, as summarized in Table 2 (including footnotes #, ##, and !!), clearly indicate that use of compositions in oxide CMP containing hydroxy alkyne surfactant plus ammonium fluoride affords defectivity levels on the polished wafers that are at least 10-fold lower than corresponding defectivity levels measured under comparable conditions for compositions in oxide CMP containing ethoxylated alkyne surfactant plus ammonium fluoride. It is his opinion that these results show an unexpected and significant result of the present invention over the prior art.

11. He states that he has been warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 USC 1001) and may jeopardize the validity of the application or any patent issuing thereon and that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true.

DECLARANT:

Junaid A. Siddiqui

Junaid Ahmed Siddiqui, Ph.D.

Date 2/21/06

Attachment: Table 2

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** TOTAL PAGE.01 **

Table 2: Oxide Removal rates with Pre-HF and post-HF Dip Defect Counts For TEOS Polished Wafers

Sample	Example 3	Example 4	Example 5	Example 6	Example 7
Silica (polysilicate free), wt %	30	30	30	30	30
Ammonium fluoride	0	0.1	0.1	0	0.1
Surfynol® 465 (An ethoxylated alkyne)	0	0	0	0	0.01
Surfynol® 104E (An acetylenic diol)	0	0	0.01	0.01	0
pH	10.5	10.5	10.5	10.5	10.5
Pre-HF Defect count at 0.13 micron *	360	66	36	133	506
Pre-HF Defect count at 0.16micron **	26	3	2	8	22
Post -HF Defect count at 0.16 micron***	296	16	11	42	116
Post -HF Defect count at 0.13 micron***	5940	803	438	1618	6158
Removal rates of oxide at 7 PSI (A/min)	4541	4575	4503	4204	4468

*, and **, based on Table 1 defect count, post-HF defect in Table 2 was calculated from the ratio of pre-HF defect count and post-HF defect count, Ratio of pre-HF defect count to post HF defect count was 11.4 at 0.18 micron, and 16.5 at 0.13 micron whereas HF containing variant, pre to post HF ratio was 5.3 at 0.18 micron and 12.17 at 0.13 micron.

*** Defect counts were obtained at 0.13 micron resolution (as had been obtained before in Table 1 in the original application) and at 0.16 micron resolution instead of 0.18 micron done in the original application; Applicant believes this is close enough for this (new) Table 2 shown above. Also, Applicant did not make use in this present work of a post-HF dip test due to safety issues, as it requires the use of large quantities of HF solution; consequently, Applicant was not able to produce experimentally-determined post-HF defect data in Table 2 (as had been done in the filed application in Table 1). However, Applicant was able to calculate the ratio of pre-HF to post- HF defect count from Table 1, which Applicant has earlier found to be approximately constant from sample to sample. Applicant has used these ratios (as indicated above) to calculate estimated post-HF defect counts in Table 2, which Applicant believes to be approximately correct.